Reuters Events

DECARBONIZING THE ENERGY VALUE CHAIN: INSURANCE AND SUPPLY CHAIN RESILIENCE

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CONTENTS

THE NEXT STAGE OF THE ENERGY TRANSITION

"The middle of 2024 saw two important energy sector events that received scant attention outside the industry... electricity generation from wind and solar energy outpaced that from fossil fuels on a 12-month trailing basis for the first time ever."

The middle of 2024 saw two important energy sector events that received scant attention outside the industry. The first happened in the European Union, where electricity generation from wind and solar energy outpaced that from fossil fuels on a 12-month trailing basis for the first time ever.[1]

The second was in China, where sales of so-called 'new energy vehicles'—including battery-powered and plug-in hybrid electric vehicles—overtook those of internal combustion engine models for the first time.[2] These events were notable not just for being firsts but also because of their significance as bellwethers.

Moves towards grid decarbonization and electrification are on the rise around the globe, with the EU, the world's second-largest economy, seen as a global leader in the energy transition, while China, the third-largest economy, is at the vanguard of vehicle electrification.[3]

Even the U.S.—the world's largest producer of natural gas[4]—is expected to see continuing new solar power capacity additions over the next 10 years.[5] This means the milestones seen last year are likely to be replicated around the world in the future.

As a result, low-carbon energy supply chain projects such as wind power, solar energy and lithium-ion battery storage are increasingly seen as mature, bankable industries. Their lifecycle risks and returns are to a growing extent well understood by the financial community, attracting commensurate levels of funding.

For the insurance sector, this offers a chance to work alongside stakeholders including equity investors, lenders, contractors and facility owners to manage risk and deploy capacity across the full lifecycle of energy transition projects.

The question is where and how insurers can best utilize their risk management expertise to continue to enable the energy transition. "Traditional insurance market capacity is finite," says Vicky Roberts-Mills, Global Head of Energy Transition at AXA XL, AXA's specialty and property and casualty arm.

"So, for me, it's how we best use that capacity, and other risk management capabilities, to support our clients in this space."

THE ENERGY INDUSTRY'S NEW WORLD ORDER

One area that deserves attention is supply chains. The energy transition is being accompanied by profound shifts in supply and demand patterns.

Most notably, renewable generation technologies allow energy to be produced locally instead of being imported from a handful of fossil fuel-exporting countries.

Given the geopolitical uncertainty linked to some of these exporters, a move to renewables is increasingly seen by many countries as potentially enhancing energy security. However, renewable energy supply chains are not without risks.

Just one country—China—dominates global production of renewable and battery technology components ranging from solar panels to lithium-ion batteries. China also controls most of the refining capacity for the rare earth elements that are required for these renewable tech components.[6]

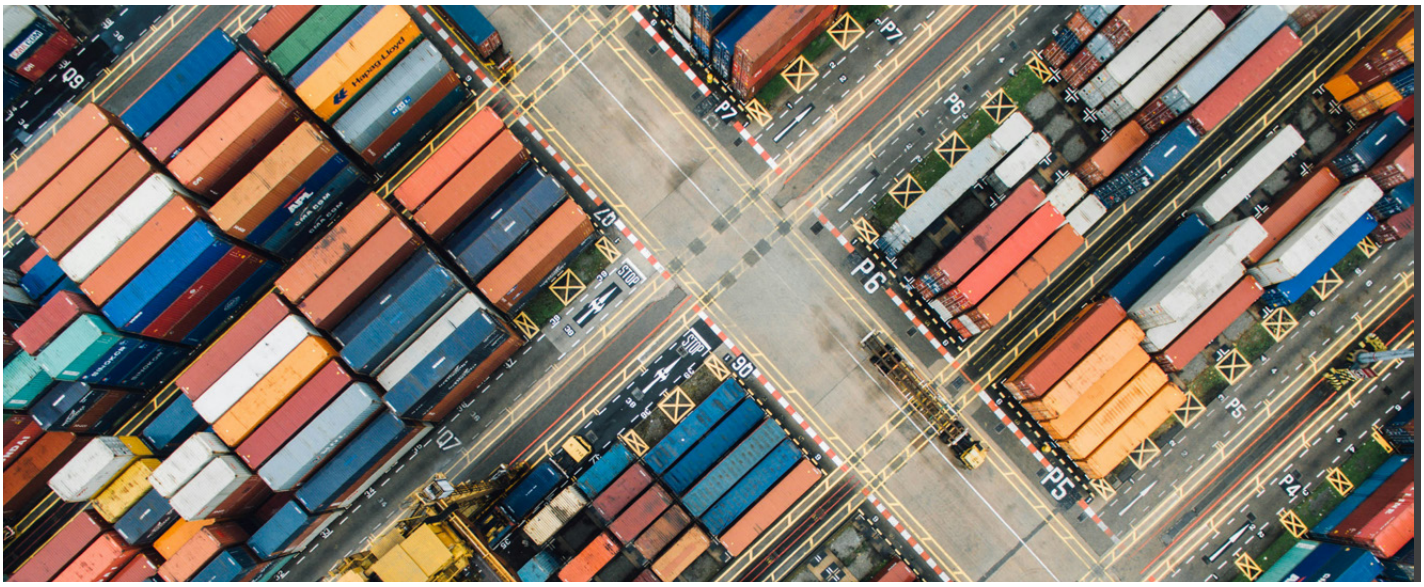
Beyond this dominance, many raw materials essential for the energy transition are also hard to get hold of widely. For example, 90% of the lithium required for lithium-ion batteries currently comes from just four countries: Australia, Chile, China and Argentina.[7]

While significant reserves have also been uncovered in the U.S.,[8] it will take a significant amount of time for their benefits to be realized. The implication is that, for now, renewable energy systems will require either collaboration with new stakeholders or the development of new supply chains—potentially creating new risks.

Insurers could play a vital role in helping to de-risk investment in such situations, says Stuart Barrowcliff, Underwriting Manager for Political Risk and Credit & Bond at AXA XL. "You're going to see new territories involved in trying to source rare earths," he forecasts.

"We're able to underwrite some of these geographies where somebody might not have a lot of experience. We know how to take apart the elements of political risk and can potentially get some cover on the table to protect from arbitrary, discriminatory, selective governmental acts."

NOVEL CHALLENGES FOR ENERGY'S SUPPLY CHAIN



Scaling up supply chains to meet the demands of the energy transition will be risky on several accounts. One example: energy production will increasingly be tied to ore mining.

"It's clear the U.S. and potentially Canada will be strained to deliver minerals, metals and the chemical and rare earth elements needed for the energy transition, so there will be continued reliance upon other countries' resources," says Katherine Gerber, Head of Energy and Energy Transition, Americas, at AXA XL.

"Given geopolitical risks, there's a lot of economic uncertainty about how these raw materials needs will be met."

This uncertainty could affect the rate at which supply chains could scale, she says. "Yes, local extraction and recycling of core minerals is happening, but will it support the high demand for cheap renewable energy in an adequate timeline?

"It could take a long time to build up the supply chain to a place where it would be sufficient to support energy transition growth. Instead, we recognize the need for global market participation and reducing the risk of global supply chains for our clients."

Such challenges are not unique to the U.S. but apply to almost every market that is looking to build up renewable tech manufacturing capacity. Alongside the difficulties associated with creating local supply chains are wider social and environmental risks that must be considered by energy transition infrastructure investors and stakeholders.

One that is top of mind in 2025 is geopolitical stability. While tariffs are a current concern, this is far from the only geopolitical hazard affecting supply chains.

In 2024, for example, the number of ships per month passing through the Suez Canal, a transit route for 30% of global container trade, dropped by more than half due to attacks on ships in the Red Sea.[9]

Meanwhile another key shipping route, the Panama Canal, witnessed the effects of another persistent supply chain risk, with climate change-induced droughts restricting traffic.

"The combination of climate change and geopolitical tensions is probably one of the greatest risks to global maritime trade in decades," said the United Nations Conference on Trade and Development.[10]

WHAT INSURANCE CAN BRING TO THE TABLE

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This supply chain picture, with markets in evolution and risks that have yet to be fully quantified, is not dissimilar to that facing the renewables industry itself a decade or two ago.

The insurance industry helped de-risk renewables on their way to maturity then and could conceivably help do the same for renewable energy supply chains now. Certainly, there is no shortage of insurance products and experience that could be transferred from the renewables sector to its supply chains.

On the product side, for example, insurers "can go from pre-financing all the way to reclamation or decommissioning," says Austin Su, Head of Structured Risk Solutions, Americas, at AXA XL. "We at AXA XL have the capability of covering almost each phase of that life cycle."

Insurers can also create surety bonds to de-risk infrastructure projects, protecting project owners against non-fulfilment of supplier obligations.

Plus, the insurance industry has access to unparalleled levels of knowledge on risk, through the claims that companies process and the technical partners they work with.

This knowledge, along with the financial strength of some of the larger insurance industry players, could help improve the bankability of low-carbon energy supply chain projects. "Our high credit quality is very beneficial to project owners," Su says.

"The insurer's long-term financial stability is critical for projects that require long-term, multi-year insurance coverage."

As the low-carbon energy tech sector grows and matures, there is also increasing interest in developing alternative risk transfer models such as captives, where companies create their own insurance entities and manage their own risks.

Captives could either insure against supplier risks directly or act as an insurer for parent company operations, thus freeing up capacity elsewhere for supply chains.

Either way, says Su, "With the usage of captive insurance, companies or projects would be able to obtain coverages that are otherwise not available in the traditional insurance markets.

"An insurance carrier's role is to partner with the client to develop the coverage and to provide coverage fronting and risk transfer capacity to facilitate a captive's risk retention strategy."

Insurance touchpoints across the energy transition journey

Research, financing & acquisition	Design & construction	Operational lifespan & decommissioning
	Property and Casualty Insurance	
	Construction Insurance	
	Global Programmes	
Risk Consulting - with specialist team for energy clients		
	Captives and Structured Risk Solutions	
Political Risk and Credit Insurance, including Contract Frustration		
Financing, Credit and M&A Solutions		
	Parametric Solutions	
Performance Guarantee Insurance		
Cyber Insurance		
Environmental Insurance		
	Excess Emissions Insurance	
	Marine, Cargo and Transportation	

EXPERIENCE ON TAP TO GROW THE SUPPLY CHAIN

"As grids get older and as we develop new technology, transformers are a huge issue in terms of supply chain."

It is this knowledge that could ultimately prove most useful in helping scale the supply chains needed for the energy transition. Research in 2024 indicated that more than half of the $19 trillion committed to financing the climate transition through to 2030 will require additional coverage.[11]

It is unclear if this includes the funding that will be required to build out supply chains. At the same time, the complex nature of supply chains may make them harder to insure than the renewable energy sector itself.

"Supply chains involve a lot of elements," says Laura Watson, Energy Transition Risk Consulting Leader at AXA XL. "Everyone's talking about critical minerals but you then have to move things around. You have to manufacture things. You need to design them. Then you need to operate them.

"And you need people with engineering skills to do all of that. Where do you find these people?"

Availability of expertise, says Watson, could be a major bottleneck for the scale-up of energy transition supply chains. Insurance firms can help to overcome this skills gap not only through expert knowledge of specific domains but also with cross-sector insights.

The insurance industry is unique in quantifying risks across a range of industries and so can provide insights that might not be clear to industry insiders. Watson cites the example of transformer availability. "Everyone wants transformers for new technology," she says.

"But existing grids need transformers. You have things like wildfires or other issues that destroy transformers. Everyone's fighting for the same equipment. As grids get older and as we develop new technology, transformers are a huge issue in terms of supply chain."

A shortage of transformers might not be immediately apparent to a renewable energy developer—but could seriously hamper the renewable energy industry's ability to scale at speed.

CONCLUSION:
WHY EARLY ENGAGEMENT IS KEY

As the energy transition proceeds at speed and scale, it is clear developing and maintaining robust and reliable supply chains will be a major challenge. It is also evident that the insurance industry can play an important part in de-risking the capital flows needed to sustain supply chain growth.

Part of this de-risking will come from existing and new insurance products, but there is also a major role for insurers to act as partners in supply chain development, bringing their expertise to bear on the need for low-risk value chains throughout the renewable energy industry.

To achieve this, "The sooner you can get in the conversation with the financier and the client, to map this out, the better," says Debbie Durkan, Head of Global Distribution, Energy Transition, at AXA XL.

"From a risk perspective, when you're six months down the line and you're trying to plug a complex supply chain need into a program, it's really complicated and difficult."

The insurance sector is already calling for earlier engagement with energy transition actors generally, and project developers may wonder whether this is really needed for supply chain matters too—particularly when financiers will also be assessing risks as part of their due diligence efforts.

However, says Durkan: "The issues come with the engagement between work that's being done on the due diligence side and the insurance piece. Bringing the broker and the underwriter to the table early in the process is key here.

"The sooner we can get in with the stakeholders at the project finance side, the sooner we can work with the team to map out what's insurable, what can be managed and where we can support them better," she says.

Without this early engagement, there is a danger of time being wasted as stakeholders struggle to understand the risks involved and who should shoulder them. With all the time in the world, this would not be a problem—but as the energy transition unfolds at pace, it is vitally important.

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